# APPENDIX F
# HOW WE CAN GROW SMARTER
## LAND COVER CHANGE PROBLEM:
### Growth Patterns of Urban Sprawl: How do zoning policies and environmental pressures influence the expansion of urban populations?

"Traffic jams and air pollution in large metropolitan areas are sure signs of expanding populations. Across the globe, 50 percent of the world's population now lives in urban areas, a gain of over one billion individuals in the last 30 years. In the United States, urban growth can be counted in a census, but how do these expanding populations affect the landscape? Are urban areas making good use of limited space or are they succumbing to urban sprawl? How do factors like zoning policies and environmental pressures influence the expansion of populations over the land?"(Masek, 1998)

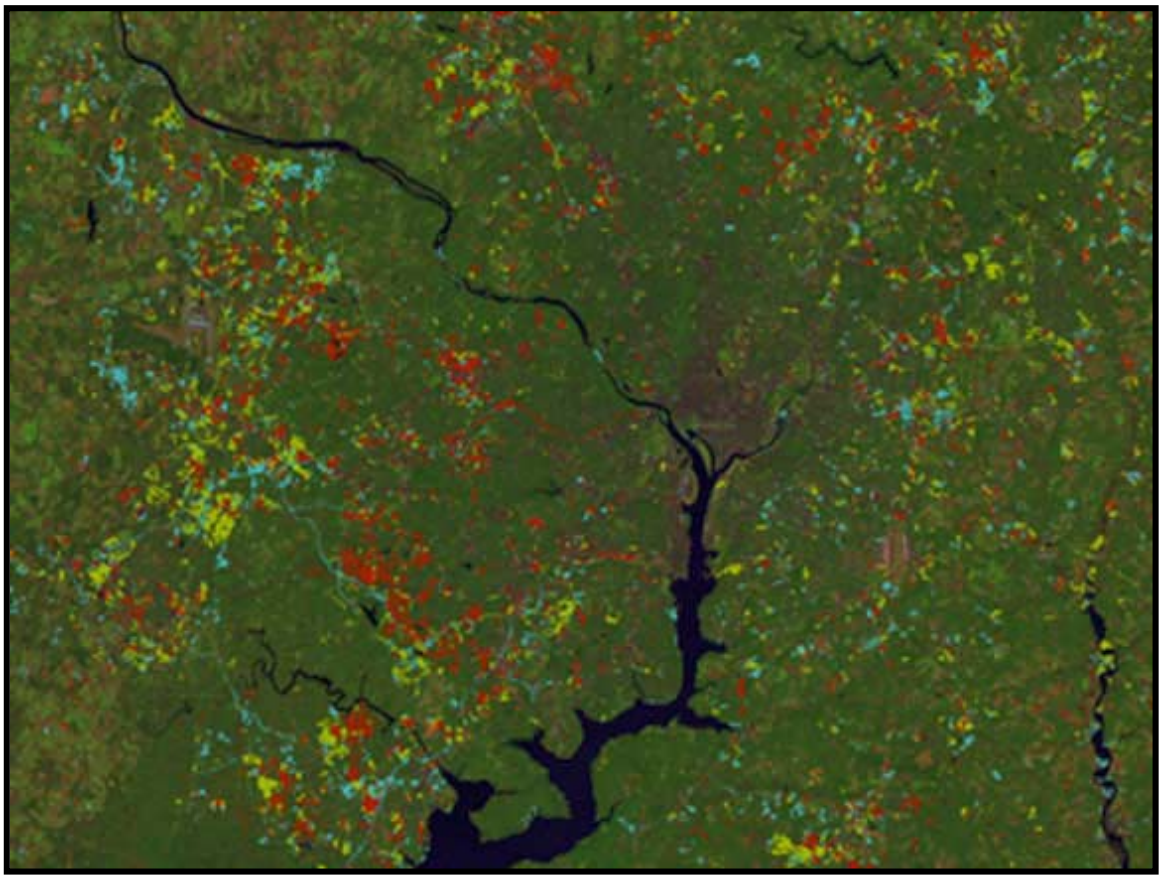
"Jeffrey Masek and Frank Lindsy, geographers from the University of Maryland, are using Landsat data to study land use efficiency, which is the amount of land area used by increasing populations. Using Landsat data acquired between 1973 and 1996, Masek and Lindsy mapped the growth of the Washington D.C. metropolitan area." (Masek, 1998)

"They found that the Washington area has expanded at a rate of 8.5 square miles (22 square kilometers) per year with notably higher growth during the late 1980s, a trend that followed the regional and national economy. They also found distinct variations in the efficiency of land use among neighboring counties in Maryland and Virginia, in part reflecting the land use policies of these jurisdictions." (Masek, 1998)

"Observing urban areas over time with satellite imagery can also be used to make predictions about future growth. Landsat imagery can show where the growth is taking place and help geographers evaluate how different urban planning programs effect population growth and land use, according to Masek. Cities such as Portland, Ore., have strict planning and environmentally sensitive zoning laws, while many southwestern cities have grown with few planning guidelines." (Masek, 1998)

"With Landsat 7 observations, Masek and colleagues intend to evaluate growth patterns of other cities around the world. With a greater number of images available, Masek can compare cities once every two years to capture detailed records of land use changes." (Masek, 1998)

Landsat Online Home page Landsat pfd, 1999, http://ltpwww.gsfc.nasa.gov/LANDSAT/CAMPAIGN_DOCS/ANNOUNCEMENTS/WG_Profile2.html



*This Landsat image shows urban growth in the Washington D.C. metropolitan region between 1973 and 1996. Red areas represent new urban infrastructure built between 1973 and 1985; yellow 1985-1990; and blue 1990-1996. New urban growth in the area tends to concentrate along existing transportation routes, particularly in the outer suburbs of Virginia and Maryland that were largely agricultural just a few decades ago.*